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U.S. Department of the Interior • U.S. Geological Survey

# MINERAL INDUSTRY SURVEYS

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## TITANIUM IN THE SECOND QUARTER 1996

### Ores and Concentrates

RGC (USA) Mineral Sands Inc. announced plans to proceed with the development of the Old Hickory deposit located south of Richmond, VA. RGC plans to produce up to 100,000 metric tons per year of ilmenite (59%-60%  $\text{TiO}_2$ ), 3,500 tons per year of a "high grade" titanium feedstock (85%  $\text{TiO}_2$ ), and 30,000 tons per year of zircon. Construction of mining and separation facilities is expected to be completed within 18 months.<sup>1</sup>

In Vietnam, Bimal Minerals Co. Ltd. is proceeding with plans to develop the Cat Khanh heavy minerals deposit located in the Binh Dinh Province. Construction of a wet separation plant at the deposit began in May and is expected to be completed shortly. When completed, Bimal plans to truck heavy mineral concentrate from the wet separation plant to its existing dry separation plant in Degi. Initial production is expected to be 4,000 tons per month of ilmenite (50-51%  $\text{TiO}_2$ ).<sup>2</sup>

### Metal

According to the U.S. Geological Survey, receipts of titanium scrap totaled 6,550 tons with 3,460 tons of home scrap and 3,090 tons of purchased scrap. Scrap receipts decreased significantly compared with those of the previous quarter. Ingot shipments were 4,760 tons.

The U.S. Department of Commerce, International Trade Administration (ITA) published preliminary results of an antidumping review for imports of titanium sponge from Russia. The review covered imports from Berezniki Titanium-Magnesium Works (AVISMA), Interlink Metals and Chemicals Inc., and Comets Inc. during the period August 1, 1994 through July 31, 1995. The ITA determined the dumping margin for Interlink to be 0%, essentially eliminating the antidumping duty. The ITA concluded that prior to May 1995, AVISMA, a producer of titanium sponge, was not aware of the ultimate destination of merchandise sold by its resellers. Further,

sales from AVISMA after May 1995 entered under Temporary Import Bond status and were not subject to the antidumping finding. Consequently, the ITA determined that AVISMA would continue to be subject to the Russia-wide 83.96% rate. However, the ITA determined the margin for Comets would increase to 89.92%. A final determination is expected before November.<sup>3</sup>

According to the Japan Titanium Society, Japanese production and shipments of titanium sponge for the second quarter were 5,320 and 5,130 tons, respectively. Ingot production and mill product shipments were 3,320 and 2,170 tons, respectively.

Titanium Metals Corp. (Timet) has reactivated the idle "Kroll" plant at its Henderson, NV, facility. The Kroll plant was closed in 1993 when Timet opened its 10,000 ton-per-year vacuum distillation process (VDP) plant at Henderson. According to a company spokesman, the VDP plant is currently running at full capacity and the reactivated "Kroll" plant is expected to be operating at 1,800 tons per year by the fourth quarter.<sup>4</sup>

### Pigment

Market forces such as a drawdown of customer inventories, consolidation in the paint industry, and weak pulp demand have contributed toward a reduced demand for titanium pigments during the first half of 1996. Several companies have curtailed production and delayed expansion plans. In Stallingborough, England, SCM Chemicals Inc. plans to close 10,000 tons per year of sulfate-route capacity and delay a 41,000-ton-per-year expansion of chloride-route capacity until July 1998. In Australia, SCM indefinitely postponed plans for a 110,000-ton-per-year chloride-route expansion at Bunbury. In Baltimore, MD, SCM plans to curtail sulfate-route capacity to 44,000 tons per year. Kemira Pigments and Ishihara Sangyo Kaisha have

elected to forego a 75,000-ton-per-year joint venture in Singapore. Hankook Titanium delayed a 30,000-ton-per-year expansion in Ulsan, Korea, until 1998.<sup>5</sup>

In Chongqing, China, Tioxide Group Ltd. and Yu Gang Co. ended a joint venture to produce titanium pigment. Although a new 25,000-ton-per-year plant is expected to come on-line in the near future, the plant will not employ Tioxide's sulfate-route technology.<sup>6</sup>

The Russian titanium metal producer AVISMA plans to add the capability to produce titanium pigment at its Berezniki facility. Initial plans call for a 60,000-ton-per-year chloride - route pigment plant. Output from the plant is expected to be sold in Russia's growing domestic market for pigment.<sup>7</sup>

#### Notice

The data in this publication have been rounded to three

significant figures. Excluding prices, all data containing more than three digits have been rounded.

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<sup>1</sup>Industrial Minerals. Titaniferous Feedstocks. July 1996, pp. 25-35.

<sup>2</sup>Industrial Minerals. Bimal Minsands JV on Course for Start up. July 1996, pp. 17-18.

<sup>3</sup>Federal Register. Titanium Sponge from the Russia Federation. V. 61, No. 146, July 29, 1996 pp. 39437-39439.

<sup>4</sup>Platt's Metals Week. Titanium Producers up Capacity on Rise in Aircraft Production. July 29, 1996, p. 8.

<sup>5</sup>Chemical Week. SCM to Cut Back Production as TiO<sub>2</sub> Market Flounders. V. 158, No. 30, Aug. 7, 1996, p. 8.

<sup>6</sup>Chemical Marketing Reporter. Tioxide Scuttles China TiO<sub>2</sub>. V. 250, No. 9, Aug. 26, 1996, p. 26.

<sup>7</sup>Inzhenernaia Gazeta. Russia. 60 K Ton of Titanium Dioxide a Year Will be Produced in the Perm Region Due to Support of Menatep. No. 24, 1996, p. 2.

TABLE 1  
COMPONENTS OF U.S. TITANIUM METAL SUPPLY AND DEMAND 1/

(Metric tons)

	1995				1996		
	Second quarter	Third quarter	Fourth quarter	Year to date	First quarter	Second quarter 2/	Year to date
Production:							
Sponge	W	W	W	W	W	W	W
Ingot	9,780	9,890	10,600	39,800	12,300	13,000	25,300
Mill products	5,910	6,140	6,200	23,300	7,150 r/	8,790	15,900
Exports:							
Sponge	69	79	45	225	87	60	147
Scrap	1,050	778	599	3,420	540	461	1,000
Ingot, slab, sheet bar, etc.	473	534	495	1,960	640	724	1,360
Other unwrought	140	81	240	603	118	61	178
Bars, rods, profiles, and wire	489	830	445	2,030	522	230	752
Other wrought	452	690	790	2,560	737	623	1,360
Total	2,680	2,990	2,610	10,800	2,640	2,160	4,800
Imports:							
Sponge	2,080	1,580	1,150	7,560	2,480	1,330	3,810
Waste and scrap	2,570	2,920	3,720	11,100	4,210	2,850	7,060
Ingot, billet	384	320	574	1,880	444	251	695
Other unwrought	309	270	229	1,180	108	64	171
Articles of titanium	93	29	35	272	58	92	152
Other wrought (mill products)	278	308	690	1,600	1,320	408	1,730
Total	5,710	5,430	6,400	23,600	8,630	4,990	13,600
Stocks, end of period:							
Sponge, Government 3/	33,400	33,400	33,400	XX	33,400	33,400	XX
Sponge, Industry	5,550	6,290	5,270	XX	5,290	5,500	XX
Scrap	8,590	9,080	9,430	XX	11,800	10,100	XX
Ingot	3,280	2,820	3,560	XX	4,120	3,940	XX
Total industry	17,400	18,200	18,300	XX	21,200	19,600	XX
Consumption:							
Sponge	5,330	5,370	5,600	21,500	6,680	6,310	13,000
Scrap	4,650	4,870	5,850	20,600	6,110	6,130	12,200
Ingot	7,450	7,390	7,930	30,600	8,960	10,100	19,100
Mill products (net shipments):	4,890	5,150	5,340	19,800	6,010 r/	7,210	13,200
Forging and extrusion billet	2,310	2,410	2,390	8,820	2,340 r/	3,190	5,530
Rod and bar	629	667	917	2,770	655 r/	1,030	1,690
Other 4/	1,960	2,080	2,040	8,180	3,010 r/	3,000	6,010
Castings (shipments)	231	99	76	480	227	169	396

r/ Revised. W Withheld to avoid disclosing company proprietary data. XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Imports and exports for second quarter 1996 include April and May only. June 1996 data not available at time of publication. Production and consumption data are for full quarter.

3/ Includes 23,600 tons stockpile grade and 9,860 tons nonstockpile grade material.

4/ Data for sheet and strip, plate, fastener stock and wire, extrusions (other than tubing), pipe and tubing, and other have been combined to avoid disclosing company proprietary data.

TABLE 2  
COMPONENTS OF U.S. TITANIUM DIOXIDE PIGMENT SUPPLY AND DEMAND 1/

(Metric tons)

	1995				1996		
	Second quarter	Third quarter	Fourth quarter	Year to date	First quarter	Second quarter	Year to date
Production	331,000	309,000	291,000	1,250,000	296,000	295,000	591,000
Imports 2/	49,600	44,500	39,600	183,000	41,900	NA	NA
Exports 3/	104,000	81,600	64,900	342,000	76,500	NA	NA
Stocks, end of period	101,000	111,000	120,000	XX	129,000	116,000	XX
Apparent consumption 4/	272,000	261,000	257,000	1,080,000	252,000	NA	NA

NA Not available. XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Based on Harmonized Tariff Schedule of the United States (2823.00.0000, 3206.10.0050, and 3206.10.0010).

3/ Based on Harmonized Tariff Schedule of the United States (2823.00.0000 and 3206.10.0000).

4/ Apparent consumption = production + imports - exports - stock increase or + stock decrease.

Source: Bureau of the Census.

TABLE 3  
U.S. EXPORTS OF TITANIUM PRODUCTS 1/

(Metric tons)

	1995				1996		
	Second quarter	Third quarter	Fourth quarter	Year to date	First quarter	April-May	Year to date
Metal:							
Unwrought:							
Sponge	69	79	45	225	87	60	147
Scrap	1,050	778	599	3,420	540	461	1,000
Billet	89	113	79	343	130	53	182
Blooms and sheet bars	306	321	251	1,130	401	634	1,040
Ingot	78	100	165	483	109	37	146
Other unwrought	140	81	240	603	118	61	178
Wrought:							
Bars, rods, profiles, and wire	489	830	445	2,030	522	230	752
Other	452	690	790	2,560	737	623	1,360
Ores and concentrates	4,090	1,950	4,690	32,300	3,090	5,190	8,270
Oxides	9,530	7,810	9,210	36,000	8,320	5,440	13,800
Pigments	94,600	73,800	55,700	306,000	68,200	43,400	112,000

1/ Data are rounded to three significant digits; may not add to totals shown.

Source: Bureau of the Census.

TABLE 4  
U.S. IMPORTS FOR CONSUMPTION OF TITANIUM METAL 1/

(Metric tons)

	1995				1996		
	Second quarter	Third quarter	Fourth quarter	Year to date	First quarter	April- May	Year to date
Unwrought:							
Sponge:							
China	139	118	135	478	79	62	141
Japan	316	273	466	1,140	849	675	1,520
Russia	1,290	1,110	519	5,490	1,450	454	1,900
Other	340	78	34	452	108	135	243
Total	2,080	1,580	1,150	7,560	2,480	1,330	3,810
Waste and scrap:							
Canada	116	53	103	368	91	88	179
France	114	103	56	364	228	136	365
Germany	140	295	109	613	140	147	287
Japan	519	309	682	1,830	487	530	1,020
Russia	685	860	1,630	3,800	1,950	962	2,920
United Kingdom	634	645	617	2,350	656	575	1,230
Other	358	652	523	1,780	657	412	1,070
Total	2,570	2,920	3,720	11,100	4,210	2,850	7,060
Ingot and billet:							
France	50	86	56	275	26	5	30
Japan	2	5	24	32	43	2	45
Russia	172	51	342	918	183	196	379
United Kingdom	160	178	118	622	86	48	134
Other	--	--	34	34	106	--	106
Total	384	320	574	1,880	444	251	695
Powder	47	46	93	238	39	14	53
Other 2/	262	224	136	941	69	50	118
Wrought:							
Articles of titanium:							
Castings	1	1	1	4	1	1	2
Other	92	28	33	267	57	91	149
Other wrought (mill products):							
Bars, rods, profiles, and wire	130	167	153	540	416	145	561
Plates, sheets, strips, and foil	93	69	445	737	775	198	973
Tubes and pipes	(3/)	27	37	96	119	58	177
Other	55	45	55	222	10	7	17
Total mill products	278	308	690	1,600	1,320	408	1,730

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes blooms, sheet bars, slabs, and other.

3/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 5  
U.S. IMPORTS FOR CONSUMPTION OF TITANIUM CONCENTRATES 1/

(Metric tons)

	1995				1996		
	Second quarter	Third quarter	Fourth quarter	Year to date	First quarter	April- May	Year to date
Ilmenite:							
Australia	38,800	123,000	74,400	294,000	89,100	38,100	127,000
Sierra Leone	--	--	--	5,950	--	--	--
Ukraine	--	21,500	--	41,200	15,800	--	15,800
Other	29,500	80	--	131,000	80,100	34,200	114,000
Total	68,300	144,000	74,400	473,000	185,000	72,300	257,000
Titanium slag:							
Australia	--	--	--	--	--	--	--
Canada	30,900	18	10,200	41,200	6,750	4,790	11,500
South Africa	73,200	106,000	103,000	347,000	41,600	103,000	144,000
Other	--	--	--	--	--	2	2
Total	104,000	107,000	113,000	388,000	48,300	108,000	156,000
Rutile:							
Australia	13,700	9,060	18,700	61,700	17,800	8,080	25,900
Sierra Leone	462	284	--	10,600	--	--	--
South Africa	19,900	14,600	39,200	114,000	32,600	20,000	52,600
Other	4	1	5,450	5,460	--	567	567
Total	34,100	24,000	63,300	192,000	50,400	28,700	79,000
Synthetic rutile:							
Australia	40,100	38,200	16,300	122,000	35,100	--	35,100
Malaysia	1,900	1,520	1,520	4,940	1,900	1,140	3,040
Other	4	38	1	43	--	--	--
Total	42,000	39,800	17,800	127,000	37,000	1,140	38,100
Titaniferous iron ore:							
Canada	20,600	65,900	1,690	88,400	308	27,200	27,500

1/ Data are rounded to three significant digits; may not add to totals shown.

Source: Bureau of the Census.

TABLE 6  
U.S. IMPORTS FOR CONSUMPTION OF TITANIUM PIGMENTS 1/

(Metric tons)

	1995				1996		
	Second quarter	Third quarter	Fourth quarter	Year to date	First-quarter	April-May	Year to-date
80% or more titanium dioxide:							
Canada	14,800	14,300	17,100	61,600	13,400	11,000	24,400
China	1,010	1,310	684	3,620	204	211	415
Finland	805	607	424	2,430	374	146	520
France	1,630	1,240	1,460	5,560	749	343	1,090
Germany	6,900	4,550	4,480	21,300	3,470	2,200	5,670
Japan	1,780	1,270	1,530	6,000	1,260	886	2,140
Norway	1,300	1,010	780	4,400	1,710	1,120	2,820
Poland	1,100	975	955	4,300	820	--	820
Singapore	871	1,130	1,090	4,450	1,150	870	2,020
Slovenia	380	555	340	1,840	571	122	693
United Kingdom	670	621	5	1,680	61	121	182
Other	1,080	818	733	3,600	929	434	1,360
Total	32,300	28,400	29,600	121,000	24,700	17,400	42,100
Other titanium dioxide:							
Canada	5,770	4,740	1,060	16,700	392	19	411
France	1,310	1,650	1,710	8,120	3,130	1,090	4,220
Germany	387	293	281	1,260	482	97	579
South Africa	1,650	1,720	881	6,280	1,230	1,450	2,680
Spain	209	660	275	1,250	2,090	2,620	4,710
United Kingdom	1,440	461	213	3,300	819	1,040	1,860
Other	886	472	956	3,180	1,650	745	2,390
Total	11,600	9,990	5,370	40,400	9,790	7,060	16,800
Titanium oxide:							
Belgium	814	468	594	2,610	660	380	1,040
Canada	2,340	2,550	1,320	8,560	2,580	245	2,820
France	1,770	1,860	1,670	6,740	1,530	1,150	2,680
Germany	31	67	387	654	1,470	1,760	3,230
Japan	263	415	291	1,210	554	274	828
United Kingdom	100	361	--	641	60	21	81
Other	310	408	346	2,070	525	476	1,000
Total	5,620	6,120	4,600	21,800	7,380	4,310	11,700
Grand total	49,600	44,500	39,600	183,000	41,800	28,800	70,600

1/ Data are rounded to three significant digits; may not add to totals shown.

Source: Bureau of the Census.

TABLE 7  
PUBLISHED PRICES OF TITANIUM MATERIALS

(End of period, second quarter 1996)

Specification of material	Range
Ilmenite, per metric ton:	
F.o.b. Australian ports	\$80-\$91
Titanium slag, per metric ton: 1/	
80% TiO <sub>2</sub> , Canada	297
85% TiO <sub>2</sub> , South Africa	351
Rutile, per metric ton:	
Natural:	
Bagged, f.o.b. Australian ports	750-975
Bulk, f.o.b. Australian ports	600-700
Sponge metal, per pound:	
Estimated, domestic	4.25-4.50
Titanium scrap, per pound:	
Turnings, unprocessed (Ti-6Al-4V)	.90- .95
Ferrotitanium, per pound:	
70% (max. 4.5% Al) per pound Ti	1.55-1.65
Titanium dioxide pigment, per pound:	
Anatase, f.o.b. U.S. plants, list price	1.06-1.08
Rutile, f.o.b. U.S. plants, list price	1.08-1.10

1/ Estimated based on U.S. imports for consumption.

Sources: American Metal Market, Chemical Marketing Reporter, Industrial Minerals (London), Platt's Metals Week, and industry contacts.